IN THE SPECIFICATION:

Please amend the paragraphs starting at page 1, line 7, and ending at line 22, as follows.

--The present invention relates to an image forming method and apparatus, a communication apparatus such as a facsimile apparatus using them, and a printing control method for the communication apparatus ~~and, more~~. More particularly, the present invention relates to an image forming method and apparatus which can form both a monochromatic image and a multivalue (including binary value) color image, a communication apparatus, and a printing control method for the communication apparatus.

BACKGROUND OF THE INVENTION

Some conventional ~~apparatus is~~ apparatuses are designed to perform binary monochromatic facsimile transmission on the basis of the facsimile transmission procedure defined by the ITU-T recommendation T. 30 and also perform color facsimile transmission according to a unique procedure.--

Please amend the paragraph starting at page 2, line 13, and ending at page 3, line 2, as follows.

--Many facsimile apparatuses have already been proposed, each of which has a printing unit capable of monochromatic facsimile transmission and allowing a user to select a monochromatic or color cartridge as described above. In such an apparatus, when a monochromatic facsimile-received image is printed, the remaining amount of black

ink is preferably detected to check whether the image is normally printed, as proposed in, for example, Japanese Patent Laid-Open No. 9-94981. An apparatus has also been proposed, in which, if the lack of black ink is detected on the basis of the result of black ink remaining amount detection, subsequent monochromatic facsimile-received images are not automatically printed but are stored in an image memory in the facsimile apparatus (memory alternate reception).--

Please amend the paragraph starting at page 13, line 10, and ending at line 27, as follows.

--The objects of the present invention can also be achieved by a control method for a communication apparatus which can receive both a monochromatic image and a color image and mount at least one of a plurality of types of image forming means, characterized by comprising the image attribute discrimination step of discriminating received images as monochromatic or color images in predetermined units, the image attribute holding step of holding the discrimination result obtained in the image attribute discrimination step, the received image output determination step of determining, on the basis of a combination of information held in the image attribute holding step and the type of mounted image forming means, whether to output a received image or store the image without outputting the image, and the control step of controlling output operation of the mounted image forming means or controlling storage of the received image.--

Please amend the paragraph starting at page 17, line 24, and ending at page 18, line 11, as follows.

--The objects of the present invention can also be achieved by an image forming apparatus characterized by comprising communication means capable of communication with a distant apparatus through a predetermined line, printing means for printing the image read by the communication means, cartridge type determination means for determining a type of loaded ink cartridge, discrimination means for discriminating whether the ink cartridge determined by the cartridge type determination means is an ink cartridge corresponding to the image received by the communication means, and notification means for, when the discrimination means discriminates that no ink cartridge corresponding to the image received by the communication means is loaded, notifying a user of corresponding information.--

Please amend the paragraph starting at page 22, line 3, and ending at line 13, as follows.

--First, the flow of operation in the printer P will be described. A conveyance path of the ~~printsheet~~ print sheet P is as shown by an arrow G. That is, the print sheet P set in the paper cassette I of the paper feeder C is picked up by a paper-feed roller 2 and a retard roller 3, and supplied to the printer B by the paper-feed roller 2. The printer B performs printing by discharging ink from a printhead 5 on the print sheet P, while it conveys the print sheet P in synchronization with the printing. When the printing

is completed, the print sheet P is discharged by a discharge roller 6 onto a discharge stacker 7.--

Please amend the paragraph starting at page 22, line 16, and ending at line 24, as follows.

--In Fig. 1, the paper cassette 1 for containing a plural number of print sheets P has a middle plate 4 on which the print sheets P are placed. The middle plate 4 is biased upward from its back by a middleplate spring 10 provided opposite to the ~~paperfeed~~ paper feed roller 2. In paper-feed stand-by status, the middle plate 4 has a structure which is pressed downward by a cam or the like and when the number of print ~~sheet~~ sheets P has decreased or there is no print sheet P, additional print sheets can be easily set.--

Please amend the paragraph starting at page 23, line 14, and ending at line 25, as follows.

--The print sheet P discharged by the discharge roller 6 is discharged onto the discharge stacker 7. The discharge stacker 7 has an auxiliary discharge tray 9 which rotates on a hinge K. In a case where the print sheet P is used from the shorter side as the top, the auxiliary discharge tray 9 is rotated so as to extend the stacker area of the discharge stacker 7 in the paper-discharge direction. The discharge stacker 7 also serves as a cover of the paper cassette 1. Note that the discharge stacker 7 and the auxiliary discharge tray 9 respectively have a plurality of ribs (not shown)~~. The~~. The printed print sheet Pis ~~slided~~ slid on the plurality of ribs, and sequentially accumulated.--

Please amend the paragraphs starting at page 25, line 6, and ending at page 26, line 6, as follows.

--Fig. 2 is a perspective view showing the detailed structure of the printer B. The printhead 5 in Fig. 2 is a cartridge-type printhead which is exchangeable for a new printhead when ink is exhausted. Alternatively, a ~~cartrige~~ cartridge-type printhead, which includes exchangeable ink tank(s) for (a) new tank(s) when ink is exhausted, can be used.

Next, a principle of ink discharge will be described below. Generally, the printhead comprises fine liquid discharge orifices, fluid channels and energy acting portions each provided at a part of each fluid channel, and energy-generating portions which generate ~~liquiddroplet~~ liquid droplet formation energy to be acted on liquid at the energy-generating portions.

The energy-generating portion may employ a electromechanical transducer such as a piezoelectric device; otherwise, the ~~energygenerating~~ energy-generating portion may irradiate an electromagnetic wave such as a laser beam upon a liquid so that electromagnetic energy is absorbed in the liquid, the liquid is heated up, and liquid droplets are discharged by action due to generated heat~~; otherwise,~~ . Alternatively, the energy-generating portion may employ an electrothermal transducer to heat a liquid and discharge the liquid. Above all, a printhead using an ink-discharge method utilizing thermal energy can perform high-resolution printing, since the liquid-discharge orifices for discharging liquid droplets for printing can be arranged in high density.--

Please amend the paragraph starting at page 26, line 20, and ending at page 27, line 5, as follows.

--Thus, the printhead, using electrothermal transducers as the ~~energygenerating~~ energy-generating portions, manufactured via semiconductor-manufacturing processes, generally has ink channels corresponding to respective ink-discharge orifices and electrothermal transducers as means for forming discharge ink droplets. The electrothermal transducers impart thermal energy to ink filling the ink channels, and discharge the ink from corresponding ink-discharge orifices. The ink channels are connected to a common liquid chamber, and they are supplied with the ink from the common liquid chamber.--

Please amend the paragraphs starting at page 29, line 7, and ending at page 30, line 12, as follows.

--Fig. 3 is a schematic view showing a construction around a photosensor 8 of the printer B. As shown in Fig. 4, the photosensor 8 is provided between the cap 20 and the end of the print sheet P, at a position opposite to a nozzle array 5c of the printhead 5. The photosensor 8 optically detects ink droplets discharged by the nozzles of the printhead 5. When there is no ink in the printhead 5, the ~~inkexhausted~~ ink-exhausted status can be judged from output from the photosensor 8.

In the present embodiment, the photosensor 8 employs an infrared LED as a light-emission device, and a lens is integrally molded on light-emission surface of the LED, so as to irradiate light in a direction approximately parallel toward a photoreception device.

The photoreception device is a photo-transistor having a 0.7 x 0.7 mm hole formed of a mold member, ~~an~~ on the optical axis, on its photoreception surface. That is, a detection range is narrowed to 0.7 mm in height and 0.7 ~~mm.~~ mm in width between the photoreception device and the light-emission device. The optical axis connecting the light-emission device and the photoreception device is set to parallel to the nozzle array 5c of the printhead S. The interval between the light-emission device and the photoreception device is greater than the length of the nozzle array 5c of the printhead 5. When the optical axis and the position of the nozzle array 5c coincide, all ink droplets discharged from the nozzles of the printhead 5 pass the detection range between the light-emission device and the photoreception device. As the ink droplets pass the detection range, the ink droplets interrupt light from the light-emission side, and decrease light intensity to the photoreception side, thus the output from the photo-transistor as the photoreception device changes.--

Please amend the paragraphs starting at page 31, line 11, and ending at page 32, line 5, as follows.

--In Fig. 5, numeral 24 denotes a controller for controlling the overall apparatus. The controller 24 comprises a CPU 25, a ROM 26 in which control programs to be executed by the CPU 25 and various data, and several threshold values used in ink-discharge status detection to be described later are stored, and a RAM 27 used as a work area for execution of various processing by the CPU 25 and ~~used~~ for temporarily storing various data.

As shown in Fig. 5, the printhead 5 is connected to the controller 24 via the flexible cable 19. The flexible cable 19 includes a control-signal line from the controller 24 to the printhead 5, and an image signal line. The output from the photosensor 8 is digitized by an A/D converter 28 so that it can be analyzed by the CPU 25. The carriage motor 30 is rotatable based on a pulse-step number from a motor driver 32. Further, the controller 24 controls the carriage motor 30 via a motor driver 33, a conveyance motor 31 via a motor driver 32, and a reading motor 52 via a motor driver 53. Also, it inputs output from the carriage home-position sensor 21.--

Please amend the paragraphs starting at page 33, line 8, and ending at page 34, line 23, as follows.

--If ink is not discharged from the printhead 5, the infrared light beam from the infrared LED 81 as the light-emission device is not interrupted, the comparator 83 inputs a high (H) level signal from the photo-transistor 82 as the photoreception device. ~~on~~ On the other hand, if ink is discharged from the printhead 5, the discharged ink interrupts the infrared light beam from the infrared LED 81, the output level of the signal from the phototransistor 82 is gradually lowered. When the output level becomes lower than the reference voltage (Vref) inputted into the comparator 83, the output from the comparator 83 to the pulsewidth counter 84 is inverted. Thereafter, when the ink discharge from the printhead 5 has been completed, the output level of the signal from the photo-transistor 8 becomes high (H) again, and when the output level exceeds the reference voltage (Vref) inputted into the comparator 83, the output from the comparator 83 is inverted again.

Thus, the pulsewidth counter 84 inputs a pulse signal of which the pulsewidth ~~is corresponding~~ corresponds to a duration in which the photosensor 8 detects discharged ink. As described above, the duration of the signal ON/OFF status is measured-by using the reference clock, and the count value is stored into the internal register of the pulsewidth counter 84. The count value is read out by the CPU 25 of the controller 24 after the completion of ink discharge, and used for judgment of existence/absence of ink.

Figs. 7A and 7B are explanatory views showing a structure of a color printhead and that of a monochrome printhead, used in the facsimile apparatus in Fig. 1. The facsimile apparatus uses the monochrome printhead as shown in Fig. 7B, having an array of 128 ~~nozzles,~~ nozzles, for printing using only black ink in 360 dpi resolution, or the color printhead as shown in Fig. 7A, having 64 black(K)-ink nozzles, 24 yellow(Y)-ink nozzles, 24 magenta(M)-ink nozzles, and 24 cyan(C)-ink nozzles, for printing in 360 dpi resolution. In this color printhead, the nozzles are also arranged in an array. Since ink colors are pre-determined with respect to respective 24-nozzle groups, the color of ink to be discharged can be selected by selecting nozzles to receive heat pulses. By selecting from the two types of printheads, high-speed monochrome printing or highprecision full-color printing can be performed.--

Please amend the paragraph starting at page 56, line 1, and ending at page 57, line 2, as follows.

--The operation unit 106 includes 1) a ten-key pad 201 for originating a telephone call;; 2) a one-touch key 203;; 3) a display unit 202 for prompting the operator to perform various operations and displaying error (warning) information;; 4) a start key 204 for starting operation such as copying, communication, or scanning;; 5) a switching key 205 for switching color processing and monochromatic processing;; 6) a resolution key 206 for setting a resolution in copying operation, communication, or the like;; 7) an on-hook key 207 that is used to capture a line;; 8) a stop key 208 for stopping various operations;; 9) a redialing key 209 for redialing a telephone number dialed in immediately preceding originating operation;; 10) an abbreviated key 210 that is used to originate a call by using a code in which a telephone number is registered in advance;; 11) a reception mode switching key 211 for switching reception modes such as automatic reception, manual reception, and F/T switching;; 12) a copy key 212 for given an instruction to perform copying operation;; 13) function mode keys for giving instructions to perform various registering operations and test operations;; 14) a display lamp 213 formed by an LED element;; 15) a set key 214 for determining information in various registering operations;; 16) an error cancel key 215 for canceling operation when an error associated with the printer occurs;; 17) a color operation display lamp 216 for displaying information indicating selection of the color printing mode or monochromatic printing mode;; 18) and an alarm lamp 217 for notifying an abnormal state of the main body.--

Please amend the paragraph starting at page 58, line 16, and ending at line 27, as follows.

--The data reception enabled/disabled state storage area (410) is constituted by a driving power supply state storage area (411), line state storage area (412), operation state storage area (413), and abnormal state storage area (414). The cartridge state storage area (420) is constituted by a cartridge presence/absence state storage area (421), cartridge-type storage area (422), and light-color cartridge attribute storage area (423). The error state storage area (430) is constituted by a paper jam state storage area (431), paper feed error state storage area (432), and carriage error state storage area (433).--

Please amend the paragraph starting at page 59, line 21, and ending at line 25, as follows.

--In the cartridge-type storage area (422), a value indicating whether the loaded cartridge is monochromatic cartridge (Mono) or color cartridge (Color) is stored. Note that this area is effective only when a cartridge is loaded into the printer.--

Please amend the paragraph starting at page 61, line 21, and ending at line 26, as follows.

--In step S704, it is checked by referring to the cartridge-type storage area (422) in Fig. 18 whether the loaded cartridge is a monochromatic or color cartridge. If the loaded cartridge is a monochromatic cartridge, the flow advances to step S706. If the cartridge is a color cartridge, the flow advances to step S705.--

Please amend the paragraph starting at page 62, line 1, and ending at line 12, as follows.

--In step S705, it is checked by referring to the light-color cartridge attribute storage area (423) in Fig. 18 whether the loaded cartridge is a general color cartridge or light-color cartridge. If a general color cartridge is loaded, the flow advances to step S706. If a light-color cartridge more expensive than a general color cartridge is loaded, the flow advances to step S711 to prevent expensive inks from being used to print a facsimile image that is only required to have a resolution lower than that of a general printer image, by excluding the image management record selected in step S701 from automatic printing targets.--

Please amend the paragraphs starting at page 62, line 25, and ending at page 63, line 17, as follows.

--In step S709, it is checked by referring to cartridge-type storage area (422) in Fig. 18 whether the loaded cartridge is a monochromatic or color cartridge. If a monochromatic cartridge is loaded, since a color facsimile-received image cannot be printed, the flow advances to step S711. If a color cartridge is loaded, the flow advances to step S710.

In step S710, it is checked by referring to the light-color cartridge attribute storage area (423) in Fig. 18 whether the loaded cartridge is a general color cartridge or light-color cartridge. If a general color cartridge is loaded, the flow advances to step S706. If a light-color cartridge more expensive than a general color cartridge is loaded, the flow

advances to step S711 to prevent expensive inks from being used to print a facsimile image that is only required to have a resolution lower than that of a general printer image, by excluding the image management record selected in step S701 from automatic printing targets.--

Please amend the paragraphs starting at page 65, line 7, and ending at page 66, line 17, as follows.

--In step S902, it is checked by referring to the cartridge-type storage area (422) whether the loaded cartridge is a monochromatic or color cartridge. If the loaded cartridge is a monochromatic cartridge, the flow advances to step S906. If the loaded cartridge is a color cartridge, the flow advances to step S903.

In step S903, it is checked by referring to the light-color cartridge attribute storage area (423) in Fig. 18 whether the loaded cartridge is a general color cartridge or light-color cartridge. If a general color cartridge is loaded, the flow advances to step S906. If a light-color cartridge more expensive than a general color cartridge is loaded, the flow advances to step S910 to prevent expensive inks from being used to print a facsimile image that is only required to have a resolution lower than that of a general printer image, by excluding the image management record selected in step S801 in Fig. 20 from automatic printing targets.

In step S904, it is checked by referring to the cartridge-type storage area (422) in Fig. 18 whether the loaded cartridge is a monochromatic or color cartridge. If

the loaded cartridge is a monochromatic cartridge, since no color page image can be recorded, the flow advances to step S910. If the loaded cartridge is a color cartridge, the flow advances to step S905.

In step S905, it is checked by referring to the light-color cartridge attribute storage area (423) in Fig. 18 whether the loaded cartridge is a general color cartridge or light-color cartridge. If a general color cartridge is loaded, the flow advances to step S906. If a light-color cartridge more expensive than a general color cartridge is loaded, the flow advances to step S910 to prevent expensive inks from being used to print a facsimile image that is only required to have a resolution lower than that of a general printer image, by excluding the image management record selected in step S801 in Fig. 20 from automatic printing targets.--

Please amend the paragraph starting at page 67, line 9, and ending at line 13, as follows.

--Fig. 22 is a flow chart ~~processing~~ showing the process of displaying information indicating the occurrence of memory alternate reception, and more specifically, the process ~~processing~~ of displaying a cause for memory alternate reception when any cartridge suitable for an image is not loaded.--

Please amend the paragraph starting at page 68, line 10, and ending at line 18, as follows.

--In Step S1003, it is checked by referring to the cartridge-type storage area (422) in Fig. 18 whether the loaded cartridge is a monochromatic or color cartridge. If a monochromatic cartridge is loaded, since no memory alternate reception due to the absence of a cartridge suitable for the image has occurred, the processing for display of a cause for memory alternate reception is terminated. If a color cartridge is loaded, the flow advances to step S1004.--

Please amend the paragraph starting at page 69, line 11, and ending at line 16, as follows.

--In step S1006, it is checked by referring to the cartridge-type storage area (422) in Fig. 18 whether the loaded cartridge is a monochromatic or color cartridge. If a monochromatic cartridge is loaded, the flow advances to step S1008. If a color cartridge is loaded, the flow advances to step S1007.--

Please amend the paragraph starting at page 74, line 21, and ending at page 75, line 2, as follows.

--In addition to the method of detecting the type of cartridge by using a printer state variable, another method ~~is available~~ may be used. In this method, projections or the like are formed on cartridges, and the numbers and positions of projections or the

like vary depending on the types of cartridges, thereby allowing a cartridge-type determination sensor (not shown) to determine the type of a loaded cartridge.--

Please amend the paragraph starting at page 79, line 6, and ending at page 80, line 3, as follows.

--As the typical arrangement and principle of the ink-jet printing system, one practiced by use of the basic principle disclosed in, for example, U.S. Patent Nos. 4,73,129 and 4,740,796 is preferable. The above system is applicable to either one of the so-called ~~an~~ on-demand type and ~~a~~ continuous type. Particularly, in the case of the on-demand type, the system is effective because, by applying at least one driving signal, which corresponds to printing information and gives a rapid temperature rise exceeding film boiling, to each of electrothermal transducers arranged in correspondence with a sheet or liquid channels holding a liquid (ink), heat energy is generated by the electrothermal transducer to effect film boiling on the heat acting surface of the printhead, and consequently, a bubble can be formed in the liquid (ink) in one-to-one correspondence with the driving signal. By discharging the liquid (ink) through a discharge opening by growth and shrinkage of the bubble, at least one droplet is formed. If the driving signal is applied as a pulse signal, the growth and shrinkage of the bubble can be attained instantly and adequately to achieve discharge of the liquid (ink) with the particularly high response characteristics.--

Please amend the paragraphs starting at page 81, line 1, and ending at page 82, line 1, as follows.

--Furthermore, as a full-line-type printhead having a length corresponding to the width of a maximum printing medium which can be printed by the printer, either the arrangement which satisfies the full-line length by combining a plurality of printheads as disclosed in the above specification or the arrangement as a signal printhead obtained by forming printheads integrally can be used.

In addition, not only an exchangeable chip-type printhead, as described in the above embodiment, which can be electrically connected to the apparatus main unit and can receive an ink from the apparatus main unit upon being mounted on the apparatus main unit but also a cartridge-type printhead in which an ink tank is integrally arranged on the printhead itself, can be applicable to the present invention.

It is preferable to add recovery means for the printhead, preliminary auxiliary means, and the like provided as an arrangement of the printer of the present invention since the printing operation can be further stabilized. Examples of such means include, for printhead, capping means, cleaning means, pressurization or suction means, and preliminary heating means using electrothermal transducers, another heating element, or a combination thereof. It is also effective for stable printing to provide a preliminary discharge mode which performs discharge independently of printing.--

Please amend the paragraph starting at page 82, line 12, and ending at page 83, line 2, as follows.

--In addition, in order to prevent a temperature rise caused by hat energy by positively utilizing it as energy for causing a change in state of the ink from a solid state to a liquid state, or to prevent evaporation of the ink, an ink which is solid in a non-use state and liquefies upon heating may be used. In any case, an ink which liquefies upon application of heat energy according to a printing signal and is discharged in a liquid state, an ink which begins to solidify when it reaches a printing medium, or the like, is applicable to the present invention. In this case, an ink may be situated opposite electrothermal transducers which ~~being~~ are heated in a liquid or solid state in recess portions of a porous sheet or through holes, as described in Japanese ~~Paten~~ Patent Laid-Open No. 54-56847 or 60-71260. In the present invention, the above-mentioned film boiling system is most effective for the above-mentioned inks.--

Please amend the paragraphs starting at page 83, line 11, and ending at page 84, line 10, as follows.

--Further, the object of the present invention can also be achieved by providing a storage medium (or recording medium) storing program codes for implementing the aforesaid function of the above embodiments to a system or apparatus, reading the program codes, by a computer (CPU or MPU) of the system or apparatus, from the storage medium, then executing the program. In this case, the program codes read from the storage medium realize the functions according to the embodiments, and storage

medium storing the program codes constitutes the invention. Furthermore, besides aforesaid functions according to the above embodiment are realized by executing the program codes which are read by a computer, the present invention includes a case where an OS (operating system) or the like ~~¥working~~ working on the computer performs a part or entire process in accordance with designations of the program codes and realizes functions according to the above embodiments.

Furthermore, the present invention also includes a case where, after the program codes read from the storage medium are written in a function expansion card which is inserted into the computer or ~~tin~~ in a memory provided in a function expansion unit which is connected to the computer, CPU or the like contained in the function expansion card or unit performs a part or entire process in accordance with designations of the program codes and realizes functions of the above embodiments.--